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**Answer ALL TWENTY FOUR questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

- 1 The table shows information about the heights, in cm, of 48 sunflowers in a garden centre.

Height of sunflower ( $h$ cm)	Frequency
$90 < h \leq 100$	8
$100 < h \leq 110$	12
$110 < h \leq 120$	15
$120 < h \leq 130$	10
$130 < h \leq 140$	3

Work out an estimate for the mean height of the sunflowers.

..... cm

**(Total for Question 1 is 4 marks)**



- 2 Use ruler and compasses to construct the perpendicular bisector of the line  $DE$ .  
You must show all your construction lines.



(Total for Question 2 is 2 marks)

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3  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$   
 $A = \{2, 3, 5, 7\}$   
 $B = \{4, 6, 8, 10\}$

(a) Explain why  $A \cap B = \emptyset$

.....  
 .....  
 .....

(1)

$x \in \mathcal{E}$  and  $x \notin A \cup B$

(b) Write down the **two** possible values of  $x$ .

....., .....

(1)

Set  $C$  is such that

$A \cup B \cup C = \mathcal{E}$   
 $A \cap C = \{2\}$   
 $B \cap C' = \{4, 6, 10\}$

(c) List all the members of set  $C$ .

.....

(2)

(Total for Question 3 is 4 marks)



4 A cylinder has diameter 14 cm and height 20 cm.

Work out the volume of the cylinder.

Give your answer correct to 3 significant figures.

.....cm<sup>3</sup>

**(Total for Question 4 is 2 marks)**

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5 Josh buys and sells books for a living.

He buys 120 books for £4 each.

He sells  $\frac{1}{2}$  of the books for £5 each.

He sells 40% of the books for £7 each.

He sells the rest of the books for £8 each.

(a) Calculate Josh's percentage profit.

..... %  
(5)

One book that Josh owns had a value of £15 on the 1st May 2019  
The value of this book had increased by 20% in the last year.

(b) Find the value of the book on the 1st May 2018

£.....  
(3)

(Total for Question 5 is 8 marks)



6  $ABC$  and  $DEF$  are similar triangles.

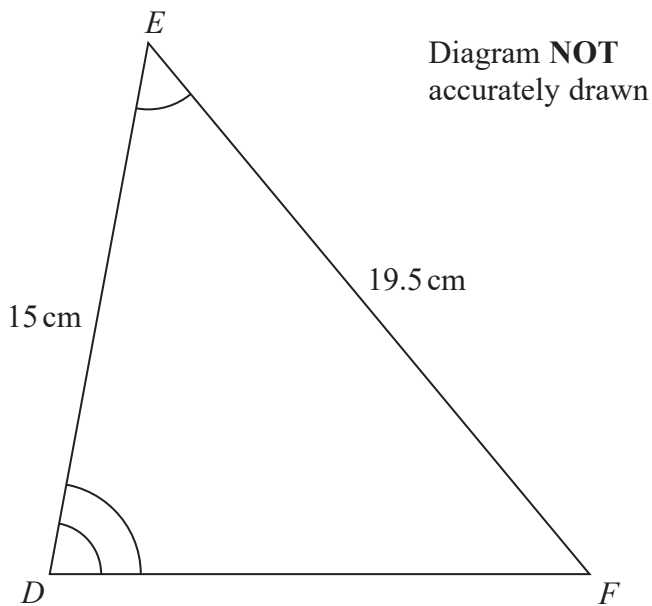
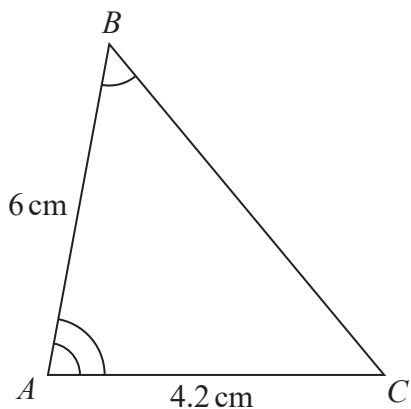


Diagram **NOT** accurately drawn

(a) Work out the length of  $DF$ .

.....cm  
(2)

(b) Work out the length of  $BC$ .

.....cm  
(2)

(Total for Question 6 is 4 marks)

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7 30 students in a class sat a Mathematics test.  
The mean mark in the test for the 30 students was 26.8

13 of the 30 students in the class are boys.  
The mean mark in the test for the boys was 25

Find the mean mark in the test for the girls.  
Give your answer correct to 3 significant figures.

.....  
**(Total for Question 7 is 3 marks)**

8 Change a speed of  $x$  kilometres per hour into a speed in metres per second.  
Simplify your answer.

.....m/s  
**(Total for Question 8 is 3 marks)**



9 Solve the simultaneous equations

$$\begin{aligned}x + 2y &= -0.5 \\ 3x - y &= 16\end{aligned}$$

Show clear algebraic working.

$x = \dots\dots\dots$

$y = \dots\dots\dots$

**(Total for Question 9 is 3 marks)**

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